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UNIVERSITY OF TORONTO
DIVISION OF EXTENSION

**MODERN ASPECTS OF PURE
AND APPLIED
ELECTROCHEMISTRY**

Session 1962-63

*offered in co-operation with
The Chemical Institute of Canada
Toronto Section*

TUESDAYS

12 Lectures

This course has been designed for graduate chemists and chemical engineers primarily, but it will also be of interest to others working in fields related to electrochemistry. It is a refresher course, and will be conducted by an industrial research electrochemist and a staff member of the Department of Chemistry, University of Toronto.

Major topics which will be covered are:

Electrode Kinetics; Anodic Films; Electrochemical Corrosion; Batteries; Fuel Cells; Electrical Double Layer; Equilibrium Properties of Electrified Interphases; Electrochemical Adsorption; Organic Electrochemistry.

LECTURERS: R. G. Barradas, Ph.D.
Department of Chemistry
University of Toronto

P. L. Bourgault, Ph.D.
Johnson, Matthey & Mallory Ltd.
Toronto

TIME: Thursday evenings, 7:30 p.m.
January 10–March 28

2054
PLACE: Room 1635, Wallberg Building

FEE: \$25

Registration:

By mail or in person at Room 201, 84 Queen's Park, 9 a.m. to 5 p.m. daily except Saturdays. Information may be obtained by telephoning WA 3-6611, locals 304, 301.

Programme of Lectures

Electrical Double Layer

Structure and Ionic Distribution. Theories of Gouy, Helmholtz, Chapman, Stern, Devanathan, Parsons, Frumkin and Grahame.

Equilibrium Properties of Electrified Interphases

Thermodynamic Theory, Ideal Polarised Electrode, Electrocaperability, Differential Capacity Measurements, Esin and Markov Effect.

Electrochemical Adsorption

Chemisorption in relation to Electrochemistry, Specific Adsorption, Structural role of Ionic and Neutral Adsorbates, Interactions between adsorbed dipoles and ions.

Organic Electrochemistry

Organic Electrode Processes, Organic inhibitors, catalysts, brighteners and levelling agents, Maximum Suppressors in Polarography, Non-aqueous solvents in electro-analytical chemistry.

Electrode Kinetics (I)

Principles, Diffusion Control, Activation Control, Tafel Relationship, Exchange Currents, pH and salt effects, Mechanism of oxygen and hydrogen evolution.

Electrode Kinetics (II)

Experimental Considerations, Reference Electrodes, Solution Purification, Rate Measurement Techniques.

Anodic Films

Passivation, Valve Metals, Kinetics of Formation of Anodic Films, Properties and Applications.

Electrochemical Corrosion

Principles, Mixed Potentials, Corrosion Inhibition and Prevention.

Batteries

Fundamental considerations, Thermodynamics, Primary Cell Systems, Secondary Cell Systems.

Fuel Cells

Thermodynamic and Kinetic Considerations, Discussion of some Fuel Cell Systems.